

ABSTRACT OF THE DISCLOSURE

A persistent p-type group II-VI semiconductor material is disclosed. The group II-VI semiconductor includes atoms of group II elements, atoms of group VI elements, and one or more p-type dopants. The p-type dopant concentration is sufficient to render the group II-VI semiconductor material in a single crystal form. The semiconductor resistivity is less than about 0.5 ohm·cm, and the carrier mobility is greater than about 0.1 cm²/V·s. Group II elements include zinc, cadmium, the alkaline earth metals such as beryllium, magnesium calcium, strontium, and barium, and mixtures thereof. Group VI elements include oxygen, sulfur, selenium, tellurium, and mixtures thereof. P-type dopants include, but are not limited to, nitrogen, phosphorus, arsenic, antimony, bismuth, copper, chalcogenides of the foregoing, and mixtures thereof.